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Paucity of trauma literature from a highly burdened developing country

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Abstract

Introduction: Trauma is the leading cause of death among a younger population not only in USA but in Pakistan as well. The high prevalence of disease should result in a larger amount of data and a larger number of publications resulting in the ability to explore improvements in the field. This study aimed to review the trauma literature generated from Pakistan.

Methods: Journals indexed with PubMed from January 2010 to December 2014 were searched using the search term “Trauma AND Pakistan” filtering for relevant dates and human reports only. The abstracts and articles were reviewed by the authors to collect data on a proforma.

Results: 114 articles were published from Pakistan during these five years; 64% of articles were published in international journals; 63% of articles were published in journals with an Impact Factor less than 1; 54% of articles were published from one of four provinces of Pakistan; 64% of articles provided Level 4 evidence whilst another 14% of articles provided Level 5 evidence on the topic; 55% of articles discussed epidemiology in non-representative populations.

Conclusions: Trauma literature from Pakistan is not only lacking significantly in quantity but is also of poor quality and is unable to offer conclusions on a particular trauma subject. There is huge room for improvement in the upcoming years.

Keywords

Trauma, literature, level of evidence, Pakistan

Introduction

According to the US Center for Disease Control (CDC) statistics for 2014, trauma is the leading cause of death of Americans aged 1–46 years and is the third commonest cause of death overall.¹ It accounts for 41 million Emergency Room (ER) visits in the USA each year and about 2 million hospital admissions costing more than \$585 billion.² Furthermore, in America more than 192,000 die from trauma annually² and it accounts for 30% of life years lost, which is equal to the combined life years lost from all cancers, heart diseases, and HIV.³

Such statistics are of limited value in developing countries. Many sick or injured people in these countries never receive medical care from orthodox health facilities, and many deaths are not reported, making health records an incomplete source of data.⁴ Injury as a research problem has also been largely ignored in developing countries;^{5–7} yet, according to some data, Pakistan, a developing country with a population approximately half of that of the USA (180.44 million

in 2013), sustains more than 2 million accidents each year, and road traffic accident rates have increased 17 times over the last 30 years.⁸ More than 50,000 people die every year and more than >500,000 are injured from trauma in Pakistan.⁹ According to a report by the World Health Organization (WHO), the actual number of road deaths in Pakistan is probably more than six times the actual reported number.¹⁰ People injured by terrorism also make a large component of trauma victims in Pakistan; there were six reported terrorist incidents in USA in 2013¹¹ compared to at least 74 incidents in Pakistan¹² which expends a lot of resources in a health care system.

Unlike the USA, there are no designated trauma centers in Pakistan. There are 94 teaching institutes

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providing tertiary care in Pakistan with 48 (51%) in Punjab and 23 (24.6%) in Sindh provinces; 55/94 (58%) are private. The trauma burden is mainly carried by District headquarters hospitals and Government teaching hospitals in the bigger cities, as less than 1% of trauma presents to the private hospitals.

Evidence-based practice in medicine is becoming the standard of care, and it is recommended that evidence-based medicine is incorporated into clinical practice to improve patient outcome.¹³ In some diseases, there are well-recognized regional differences in behavior and outcome; in esophageal carcinoma for example, the spectrum of disease and outcome is totally different in the Japanese population compared to the rest of the world. Regional research in trauma is important because of differences in the quality of roads and vehicles used, mechanisms of injury and differences in pre-hospital and hospital care in different regions of the world result in a different spectrum of disease and outcomes. The diseases with greater prevalence in a geographical area are likely to be studied more, not only because of large numbers of patients, but also due to queries arising in the minds of clinicians while treating these patients. Unfortunately, like other fields of medicine, trauma is neglected by the researchers in developing countries.

This study reviews the trauma literature published from Pakistan in indexed journals over the last five years, the aspects of trauma covered in these articles, the quality of evidence contributed and the institutes which have published them.

Material and methods

All types of articles covering any aspect of trauma in the population of Pakistan published in a journal indexed on Pubmed between January 2010 and December 2014 were included. A PubMed search was conducted with the search term "Trauma AND Pakistan" filtered for the relevant dates of publication and restricted to human species reports only. All abstracts were read by the primary investigator to exclude irrelevant or duplicate articles.

All included articles were reviewed by both investigators and data were extracted on a bespoke data collection proforma capturing the title of the article, the name of the journal, year published, and impact factor (IF) of the journal (for the year in which the article was published according to www.researchgate.net). Also collected were the specialty institute and city of the corresponding author, study design, data collection tool, topic covered in the article, and level of evidence provided by the article.¹⁴ Data were analyzed using SPSS 19. Categorical data were expressed in percentages and proportions.

Results

A total of 333 abstracts were retrieved and filtering of these to exclude irrelevant articles reduced the number of included studies to 114 published over the five-year period in indexed journals from all over Pakistan (Table 1). Just over one-third (36%) of articles were published in three National journals (Journal of Pakistan Medical Association, Journal of College of Physicians and Surgeons Pakistan, and Journal of Ayub Medical College); 35% of articles were published in journals with no IF and a further 28% in journals with an IF less than 1. The government and semi-government hospitals, which manage more than 95% of the trauma contributed only 49% of the trauma articles with over half (54%) of all articles originating from a single, but second largest, province of Pakistan and virtually all of those (95%) from a single city of that province (Figure 1). The articles were mainly case series and cross-sectional studies, reporting only the incidence and prevalence of trauma findings in non-representative samples. Three quarters (78%) of articles provided no more than Level 4 or 5 evidence; only single articles provided Level 1¹⁵ or Level 2¹⁶ evidence. Details of the aspects of trauma reported in the 114 articles are shown in Figure 2, with 55.3% articles describing epidemiology in non-representative samples – 14 articles covered different aspects of the 2005 Kashmir earthquake, 16 articles were concerned with Road Traffic Accidents, 12 about traumatic brain injury, 9 reported bomb blast injuries and 9 discussed gunshot injuries. There were only five articles about different visceral injuries.

Discussion

The impact of trauma is greater than any other diseases in Pakistan, but the literature being produced in the country is sparse and provides a poor level of evidence. What little trauma literature is being generated comes from selected areas and is not generally representative of the whole population; similarly, the ratio of trauma literature generated by those Government hospitals which manage the vast majority of the trauma is much less than expected. Low-quality literature is being published in journals with low or absent IF, and while it is accepted that IF is not the sole measure of journal quality or importance, publishing in high IF journals will help to spread the message better about improving trauma care. The sparse nature of the content and low quality mean that it is not possible to draw any valid conclusions on the basis of local literature in order to make amendments in national trauma systems to improve the quality of trauma care throughout the country of Pakistan.

Table 1. Characteristics of articles.

Variable	Frequency (%)	Variable	Frequency (%)
Year of publication		Province of corresponding author	
2010	25 (21.9)	Sindh	62 (54.4)
2011	20 (17.5)	Karachi	59 (95.2)
2012	22 (19.3)	Punjab	17 (14.9)
2013	32 (28.1)	Khyber PakhtunKhwa	13 (11.4)
2014	15 (13.2)	Islamabad	11 (9.6)
		Baluchistan	0
Status of journal		Study design	
National	41 (35.9)	Meta-analysis	1 (0.9)
International	73 (64.1)	Cohort	2 (1.8)
		Case control	2 (1.8)
		Cross-sectional studies	28 (24.6)
		Case series	65 (57)
		Case reports	8 (7)
		Commentary/expert opinions/letter to editor	8 (7)
Impact factor		Level of evidence	
Not Allocated	40 (35.1)	1	1 (1.9)
0.1–1.00	32 (28.1)	2	1 (0.9)
1.1–2.00	28 (24.6)	3	23 (20.2)
2.1–3.00	11 (9.6)	4	73 (64)
3.1–4.00	2 (1.8)	5	16 (14)
>4.0	1 (0.9)		
Institutions of corresponding author		CEBM categories	
Government/semi-government	56 (49.1)	Epidemiology	63 (55.3)
Private	46 (40.3)	Diagnosis	16 (14)
WHO	4 (3.5)	Treatment benefits/harms	35 (30.7)
Foreign	8 (7.0)	Screening	0 (0)
Specialty of author			
General surgery	21 (18.4)		
Neurosurgery	18 (15.8)		
Emergency medicine	13 (11.4)		
Orthopedics	12 (10.5)		
Plastics	8 (7.0)		
^a Others	42 (36.8)		

WHO: world health organization; CEBM: Centre for Evidence Based Medicine.

^aOthers include community medicine, forensic medicine, cardiothoracic surgery, psychiatry, rehabilitation.

Baluchistan is the largest province of Pakistan by area but has contributed no data at all to the trauma literature during these five years, whereas Punjab, which is the largest province by population has contributed only 15% of the data. Sindh, has contributed 54% of the trauma literature but nearly all of it (95%) originates from a single city of this province – in other words, the single city of Karachi with an estimated population of 23.4 million in 2013,¹⁷ has contributed more than half of

all of Pakistan's trauma literature over a five-year period, which should alarm both the Government authorities and the health care personnel of Pakistan.

It is clear from Figure 2 that many vital aspects of trauma care have been ignored throughout the country as there is no little or no literature produced on important issues such as pre-hospital trauma treatment, emergency management including blood transfusions and resuscitation, damage control surgery, trauma teams,



Figure 1. Trauma articles and institutes per province. The rest of the articles are by foreign authors (eight who participated in the 2005 Kashmir earthquake effort and three studies from members of the World Health Organization).

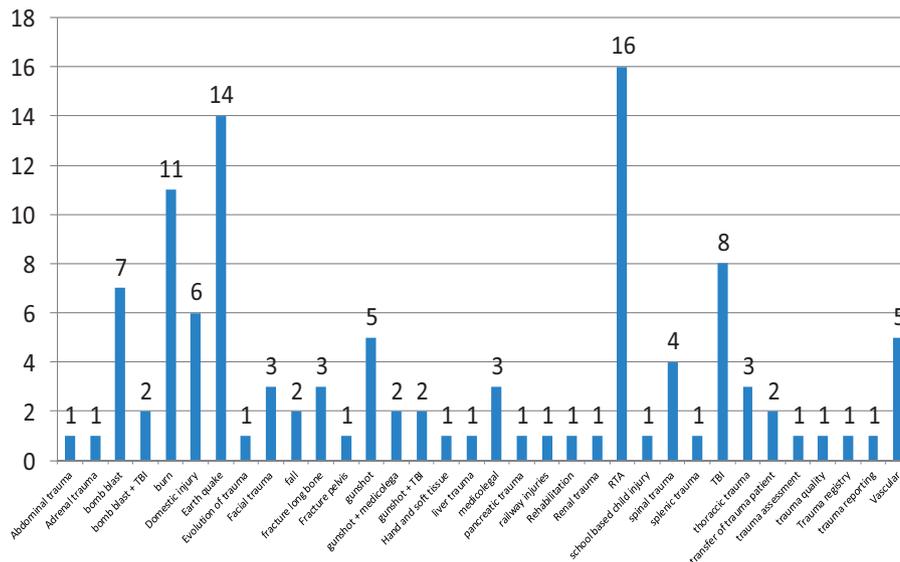


Figure 2. Articles grouped on the basis of aspect covered.

comparison of different interventions, and rehabilitation of trauma patients.

The lack of ability to produce good literature is multifactorial and includes the lack of availability of national registry programs, the absence of designated trauma centers across the country, untrained staff collecting prospective data, poorly trained people

analyzing the data, and poor writing skills. In addition, it is recognised that many healthcare professional’s motivation for writing is to achieve a promotion rather than to produce high-quality literature which might improve the trauma systems countrywide.

There are a variety of relatively simple measures that can improve the quality of research, such as increasing

awareness at the national level, as well as at the level of each hospital, regarding the importance of regional trauma research and its implications. The public of Pakistan need to be educated to inform the relevant authorities about each trauma incident and each mortality should be registered in newly established national or local trauma registries. A pre-hospital care system should be established and staff properly trained about the safe and immediate transfer of unstable trauma patients to regional centers and collaborative research between the institutions of a single city and with other cities is required to compare differences in trauma care and outcome to provide the evidence to drive improvement across the country. Referrals from one center to another should also be properly documented and communicated to the referred hospital trauma team. There is an overwhelming need for epidemiological workshops and courses to make medical staff able to plan better studies, collect better data, interpret it correctly, and get it published in well-reputed journals; similarly, there are a wide range of areas still to be explored including different interventions in trauma. These steps are essential to provide better trauma care to the people of Pakistan.

Conclusion

Trauma literature from Pakistan, an overburdened developing country, is scanty and provides a low level of evidence. The generation of trauma literature is not uniform across the country leaving significant room for improvement. The relevant national authorities should take steps to ensure quality research is produced to improve the outcomes of trauma in Pakistan.

Authors' contributions

Rizwan Sultan: literature search, study design, data collection, data analysis, data interpretation, writing, critical revision.

Hasnain Zafar: concept of study, data collection, data analysis, data interpretation, writing, critical revision.

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